



Dam's Biogeomorphology: Towards the conceptualization of reservoir backwater impacts on fluvial ecosystem

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A model is presented which provides a guidance for further biogeomorphological research on rivers affected by temporary inundation of their channel and floodplain caused by so called backwater fluctuations (BF) upstream from a dam reservoir (within so called backwater fluctuations (BF) zone). Backwater influences on rivers were divided into: (i) first-order (changes in river hydrodynamics), (ii) second-order (changes in river sedimentology, morphology, vegetation characteristics, animal habitats and land management by humans) as well as, (iii) feedbacks induced by first- and second-order influences of backwater fluctuation. The model highlights that backwater-induced changes in abiotic and biotic components of river system trigger further feedbacks between them that additionally influence these components even without a direct backwater influence. Backwater-induced changes in hydrodynamics and sediment transport favour seed germination and growth of plants and decrease their mortality during floods, but also eliminate plants intolerant to prolonged inundation and intensive fine sediment deposition. These impacts may change the biogeomorphological structure of river system by modifying trajectories of biogeomorphic succession cycles and related zones of vegetation–hydromorphology interactions in the river corridor.

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